THE SPANISH SURVEY OF HOUSEHOLD FINANCES (EFF): DESCRIPTION AND METHODS OF THE 2011 WAVE

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Abstract

This paper describes the methods of the fourth wave of the Spanish Survey of Household Finances (EFF2011), paying special attention to the innovations relative to the previous waves. The EFF2011 was designed to give continuity to the information on household finances collected through the EFF2002, EFF2005 and EFF2008. A desirable characteristic present in all four waves is the oversampling of wealthy households. This is achieved on the basis of the wealth tax through a blind system of collaboration between the National Statistics Institute and the Tax Office which preserves stringent tax confidentiality. An additional important characteristic of the EFF is that the second, third, and fourth waves have a panel component. Further, a refreshment sample by wealth stratum has been incorporated in those waves to preserve cross-sectional representativity and overall sample size. The EFF is the only statistical source in Spain that allows the linking of incomes, assets, debts, and consumption at the household level. There are now four editions of the EFF, which means that these statistics capture the financial situation of households over a long period, including an expansion and a recession. Moreover, the financial situation of Spanish households can now be compared with that of households in other European countries thanks to the recent availability of similar surveys in the rest of the EU.

Keywords: wealth survey, oversampling of the rich, panel, refreshment sample, imputation.

JEL Classification: C81, D31.

Resumen

Este documento describe los métodos de la cuarta ola de la Encuesta Financiera de las Familias (EFF2011), prestando atención especial a los cambios introducidos respecto a las olas anteriores. La EFF2011 fue diseñada para dar continuidad a la información sobre finanzas de los hogares recogida a través de la EFF2002, la EFF2005 y la EFF2008. Una característica deseable presente en las cuatro olas es el sobremuestreo de los hogares más ricos. Este sobremuestreo se consigue a partir del impuesto sobre el patrimonio, a través de un mecanismo de colaboración ciego entre el Instituto Nacional de Estadística y la Agencia Tributaria que respeta estrictos requisitos de confidencialidad. Una característica adicional importante de la EFF es que la segunda, la tercera y la cuarta ola tienen un componente de panel completo. Además, se ha incorporado una muestra de refresco por estratos de riqueza en esas olas para mantener la representatividad de corte transversal y el tamaño muestral total. La EFF es la única fuente estadística en España que permite relacionar las rentas, los activos, las deudas y el gasto de cada unidad familiar. En la actualidad hay cuatro olas de la EFF y, por lo tanto, esta estadística refleja la situación financiera de los hogares a lo largo de un período dilatado de tiempo, que abarca una expansión y una recesión. Además, la situación financiera de los hogares españoles puede ser comparada con la de los hogares en otros países europeos gracias a la disponibilidad reciente de encuestas similares en el resto de la Unión Europea.

Palabras clave: encuesta de riqueza, sobremuestreo de los hogares más ricos, panel, muestra de refresco, imputación.

Códigos JEL: C81, D31.

1 Introduction

The Spanish Survey of Household Finances (EFF) is a survey conducted by the Banco de España[1] that collects information about income, assets, debts, and consumption at the household level. The fourth wave of the EFF, referring to the end of 2011, was conducted to bring up to date the information on household finances first collected in 2002, and then in 2005 and 2008. It contains the same type of information approximately three years later and hence allows the changes that have occurred since then to be assessed. It also provides an updated representative picture of the structure of household assets and debts at the household level.[2] Moreover, since part of the EFF sample is a panel, the combined samples provide information on the distribution of individual changes between periods.

A desirable characteristic of the EFF present in all waves to date is the oversampling of wealthy households. The distribution of wealth is heavily skewed and moreover some types of assets are held by only a small fraction of the population. Therefore, unless one is prepared to collect very large samples, oversampling is important to achieve not only representativeness of the population but also of aggregate wealth. Furthermore, it is necessary to enable the study of financial behaviour at the top of the wealth distribution.

Oversampling in the EFF is achieved thanks to the collaboration of the Tax Office and the National Statistics Institute (INE) on the basis of individual wealth tax records, while preserving stringent tax confidentiality.

An additional important characteristic of the EFF is that the second, third and fourth waves have a panel component. This was judged important both for descriptive and research purposes. Having a panel allows the study of transitions and to account for heterogeneity among households. Moreover, with the EFF2011 a sub-set of households can be observed over a period of nearly ten years. This expands the possibilities for analysing the behaviour of income, wealth and consumption over the household life cycle.[3]

That said, a complete fresh cross-section would be better for capturing the structure of the population at the time of the survey. In the second and third waves the compromise adopted was to try to re-interview all the previous wave respondents and, additionally, to incorporate a refreshment sample to preserve cross-sectional representativity and overall sample size. However, in the fourth wave the size of a full panel component would not allow a sufficiently large refreshment sample within the budget restriction. Therefore, only a subsample of the 2008 respondents was included in the 2011 sample.

This paper describes the main features of the methods of the EFF2011. Section 2 briefly outlines the questionnaire. Section 3 describes the sample design. Section 4 presents the fieldwork and an analysis of unit non-response. Section 5 describes the final sample, in

1. The Microeconomic Information and Analysis Unit of the DG Economics, Statistics and Research is responsible for producing the EFF. Micro data and more information can be found at: http://www.bde.es/bde/en/areas/estadis/Otras_estadistic/Encuesta_Financi/

2. The fifth wave is scheduled to take place at the end of 2014.

3. The usefulness of the information contained in a survey such as the EFF prompted the system of euro area central banks to decide to conduct a household finance and consumption survey (HFCS) following a methodology similar to that of the EFF, the results of which were published in early 2013. The HFCS provides detailed, harmonised information on households in 15 euro area countries based on a sample of more than 62,000 households. The methodological report of the first wave of European surveys, in which the data for Spain are those of the EFF2008, can be found on the ECB website at http://www.ecb.europa.eu/pub/pdf/other/ecbsp1en.pdf .

particular the panel component and the amount of oversampling. Section 6 discusses the calculation of cross-sectional and longitudinal weights. Lastly, Section 7 presents an analysis of item non-response and concludes with some brief comments on imputation issues.

2 The questionnaire

2.1 Contents

The main questionnaire is fundamentally the same as in the previous waves with some minor changes detailed below. We list here its main sections for completeness:

1. Demographics[4]
2. Real assets and their associated debts
3. Other debts
4. Financial assets
5. Pension plans and insurances
6. Labour market situation and labour income (for all household members)
7. Non-labour income in the previous calendar year (2010)
8. Means of payment
9. Consumption and savings

This questionnaire was presented as a 'Computer Assisted Personal Interview' (CAPI) in all waves. Compared to paper questionnaires the use of CAPI facilitates the task of the interviewers in what is a complex questionnaire, allows some basic checks for errors at the interview stage, and enables automatic conversion from pesetas to euros and vice versa.

All euro questions can be answered in intervals (self-reported ranges or choosing a predefined range from a list) when the respondent is unable or unwilling to provide a point estimate.[5]

Additionally, interviewers may introduce comments to help improve the quality of the data at any stage of the interview. This has proved very useful in order to correct mistakes or understand particular situations during editing by the Banco de España.

The median time taken to complete the EFF2011 questionnaire was around 60 minutes and 90% of the interviews took less than one and a half hours. Only for 1% of the interviews was the duration above 150 minutes.

Table 1 reports some figures concerning the number of questions put to households. The number of euro questions asked is similar with that for previous EFFs (25 at the median, 24 in 2008) but the overall number of questions is higher (242 at the median, 221 in 2008).

2.2 Changes with respect to the 2008 wave

An important addition to the substantive content of the questionnaire was the inclusion of probabilistic expectation questions on (i) the expected probability distribution of the change in the price of the main residence, (ii) the expected probability of employees losing their job, and (iii) for the unemployed, their expected probability of finding a job. The answers to the question on expected house prices are encouraging because a large fraction of people seem to understand it and respond meaningfully.

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4. The demographic questions were worded so as to be comparable with similar questions in other household surveys carried out by the INE, the EU-SILC in particular.

5. A self-reported range is defined by a lower and/or upper bound provided by the household. The possibility of having successive open range questions was not considered since we felt it could alienate respondents.

On more technical matters, the change in 2011 in the National Statistics Classification of occupations was addressed by asking for a description in words of the main occupation but without removing the question included in the three previous waves (nor its list of closed options) for comparability purposes.

Compared with the 2008 wave, the number of requests for confirmation, promptings for additional information when rare answers are received, cross-checks with other answers in the questionnaire, etc has been expanded considerably. Questions aimed at matching members of panel households have also been improved.

In order to facilitate interviewers' work when knocking at the door while ensuring compliance with protocols, a one-page paper contact guide was designed (this was different for panel and non-panel households). The information the interviewers recorded had to be transferred later (but before the start of the main interview) to their computer.

Finally, the screen lay-out was extensively re-designed to improve clarity.

3 Sample design

A fundamental characteristic of the EFF sample is that there is oversampling of the wealthy. This was judged important when designing the EFF since typically a small fraction of the population holds a large share of household wealth and, furthermore, many financial assets are held by only a small fraction of the population. Therefore, a standard random sample would not contain enough observations for many key analyses of wealth microdata. Thanks to the collaboration of the National Statistics Institute (INE) and the Tax Office, a significant oversampling of the wealthy was achieved in the EFF.

Like the previous two waves, this fourth wave of the EFF had two objectives. The first was to achieve a sample with the same overall characteristics as in the EFF2002, namely a sample representative of the current population with oversampling of wealthy households following the same criteria as in the first wave. The second was to turn part of this sample into a panel by re-interviewing households that took part in the previous wave. The panel component provides statistical information on transitions between states and individual changes in magnitudes. Moreover, it facilitates the study of causal effects.

To achieve this goal a refreshment sample by wealth stratum was designed to (i) supplement the panel component up to a total sample size of 7,000 households and to (ii) ensure that, when used jointly with the panel, the overall sample would fulfil representativity and oversampling requirements. As a preliminary step for the design of the refreshment component, the wealth (and income) tax information of the panel sample was updated.

However, in contrast to the previous two waves, we did not aim to have a full panel component i.e. we did not aim to re-interview all households that participated in the EFF2008 (namely, 6,197 households). Indeed, the size of the final EFF2008 sample was too large to allow a sufficiently large refreshment sample within the budget limitations. It was decided to keep in the panel sample all households participating since 2002 because they form a sub-sample of households in which almost ten years of their life-span can be observed. 300 households participating since 2005 (out of 2,042) and 600 participating since 2008 (out of 2,230) were randomly dropped for the 2011 sample.

3.1 Basis for oversampling of the wealthy

Spain had a wealth tax ('Impuesto sobre el Patrimonio') until 2007 which was discontinued for a few years and then re-established for the years 2011 and 2012. The EFF oversampling is based on individual wealth tax file information from the 2007 wealth tax. The people subject to this tax in Spain at that time were those with taxable wealth over €108,000, and around one million individuals (corresponding to approximately 700,000-750,000 households) filed a wealth tax return.

The choice of wealth strata was based on the percentile distribution of households filing a wealth tax return. We define eight strata which were oversampled at progressively increasing rates. The intervals used for the EFF2011 were the same as for the EFF2008. These were revised upwards from the values used for the EFF2002 and EFF2005 (see Table 2 for the definition of the new intervals). Strata 2 and 3 capture slightly less than half of the distribution of taxable wealth. Strata 4, 5 and 6 capture the third and fourth quartiles except for the last two percentiles, which are represented by the last two strata.

In Navarre and the Basque Country there was no oversampling of the wealthy because the national Tax Office does not hold the personal tax file information for these regions.

3.2 Sampling design

The population frame for the sample was the Population Register corresponding to January 2011,[6] in which the units are households as defined by their postal address. With this information sent by the INE to the Tax Office, the latter constructed for each address three variables based on information drawn from both wealth and income tax returns. These data were the starting point for the sampling.

The first variable, the wealth stratum indicator, is based on the total declared taxable wealth of the household, which was obtained by adding up the returns of all its members when applicable. The second, for those filing income tax but not wealth tax returns, is a variable indicating the quartile in the national taxable income distribution to which the household belongs. Finally, information on the per capita income of the household was also added. The income variables were helpful in the selection of sample replacements (as we shall see below), and to ensure that households from all income levels were selected in the sample. The latter was obtained by using systematic sampling with random start in a properly ordered data frame. Furthermore, the income quartile indicator was used to correct for non-response in large cities. The income tax information relating to 2007 was used for the sake of consistency with wealth tax information. As is usually the case, there was some limited mismatch between the tax and the Population Register sources.

The sampling design differed depending on municipality size. For all provincial capitals (there are 52 of them) and municipalities over 100,000 inhabitants, fresh oversampling was designed to supplement the panel sample by wealth stratum taking into account the updated wealth strata of panel households. Within each of the eight wealth strata the new sampling was random, closely following the sampling procedure used in the first three waves for municipalities of that size.

For municipalities with 100,000 or fewer inhabitants there was no fresh oversampling. The sampling was a two stage cluster design in which the primary sampling units (PSUs or 'secciones censales') were the same as those used in the first and second waves.[7] Within each PSU, households were randomly selected to supplement the panel households belonging to it, up to an overall number of seven households per PSU. In the first wave, oversampling in municipalities of this type was achieved only for PSUs with ten or more wealth tax filers. For these PSUs four wealth tax filers and four non-wealth tax filers had been drawn.

Sampling for Navarre and the Basque Country was similar to that for the group of smaller municipalities but with a finer stratification by municipality size for small municipalities. Specifically, the panel sample was supplemented up to a total of seven households within each of the PSUs used in the previous waves.

3.3 Confidentiality guarantees

The Tax Office is subject to very stringent confidentiality requirements and cannot release any personal tax information (not even in the form of ranges). To overcome the problem and enable wealth tax oversampling while preserving confidentiality, the National Tax Office

6. This is usually obtained the following March/April.

7. In the first wave the PSUs were selected with a probability proportional to their population.

volunteered to actually do the random sample selection itself as instructed by the Banco de España and the INE.

3.4 Replacements

To try and preserve as much as possible the oversampling scheme devised for large municipalities and all provincial capitals, tightly controlled replacements were chosen.[8] The use of controlled replacements is similar to post-stratification and weight adjustments within cells when data collection is completed. An important reason in the case of the EFF for having controlled replacements was the fact that the BdE does not have any indication of the wealth stratum to which the sample households belong, thus ruling out the possibility of a 'directed' effort during the field work should it be found that the response rate of certain strata was particularly low.

In particular, in large cities and provincial capitals up to four replacements were provided for each original household in the sample that would serve as replacements of that household only. These replacements were the two households immediately before and the two immediately after the household in a list ranked by income quartile (for non-filers of wealth tax returns), wealth stratum, and per capita household income. Replacements had to belong to the same income quartile (for non-filers of wealth tax returns) or the same wealth stratum as the sample household. This was done within municipalities to keep replacements geographically not too distant from the original sample household. In the case of smaller municipalities, Navarre, and the Basque country, a more standard scheme of a pool of eight replacement households as potential substitutes for eight sample households (within the same PSU) was adopted.

In contrast with the previous two waves, no replacements were provided for panel households. This allowed for a larger refreshment sample.[9]

8. In the first wave controlled replacements were also chosen in small municipalities in the case of PSUs with 10 or more wealth tax filers.

9. When designing the refreshment sample a 66% participation rate was assumed for the panel sample based on the rates of the previous waves.

4 Fieldwork

The fieldwork lasted from mid-October 2011 to end-April 2012.[10] During that time 13,442 households were contacted.[11] Given the distribution of interviews over the fieldwork period, the reference period for the EFF2011 is December 2011, when half of the complete valid interviews had been collected.

As in the EFF2008, the programming of the CAPI questionnaire and the fieldwork were contracted out to NORC (Chicago University). This allowed the EFF2011 to benefit from NORC's first-hand experience in conducting the EFF in 2008 in addition to its experience in conducting the Survey of Consumer Finances (SCF) in the US on behalf of the Board of Governors of the Federal Reserve System since 1993. In turn, NORC hired a local fieldwork agency (TNS-Demoscopia) to have access to local interviewers. The local company was different from the one hired for the EFF2008 and worked under NORC's close supervision.

The fieldwork for wealth and income surveys is particularly demanding because of high unit non-response due to the nature and difficulty of the questions asked.

4.1 Efforts to reduce non-response

A pack with introductory letters from the Governor of the Banco de España and from the fieldwork agency, and an accompanying brochure were sent by the fieldwork company to the sample households. A website and telephone numbers were also provided for households to confirm the legitimacy of the survey and answer questions they might have. The Banco de España's local branches were notified of the survey since people often turned to them for confirmation.

When visiting households, interviewers took with them some additional documentation to illustrate the way the data collected were used. In particular they provided the household with a copy of the Banco de España Economic Bulletin article describing the results of the EFF2008 as well as a selection of articles that appeared in a variety of newspapers following the publication of the EFF2008 results. Finally, a token gift was offered to participating families and another to panel households even if they did not agree to collaborate in the fourth wave.

Before the first in-person visit by an interviewer, efforts were made from the fieldwork company central office to make a first contact with households by telephone in order to find out about suitable times for an interviewer visit. This was possible for a large number of panel cases (who had been prompted to voluntarily provide a telephone number at the end of the 2008 interview) and for some non-panel ones. However, if households expressed a wish not to participate during this telephone contact they were told that an in-person visit was required by the Banco de España.

4.2 Training the interviewers

To minimise non-response and ensure good quality data, the proper training of interviewers is of paramount importance. For the EFF2011, centralised training was carried out at the beginning of October, just prior to the start of data collection. This took place at a venue

10. For the number of interviews completed in each month of fieldwork, see Table 3.
11. See Table 4 for more details.

outside Madrid to try and ensure full-time commitment to this task. First, from Wednesday to Friday of the previous week field coordinators were given two to three days' briefing (a third day was given for those selected to help train the interviewers). Following this, from Monday to Friday, 87 interviewers received five days' training.

There were 5 training rooms, each with one main and one auxiliary trainer. During these sessions the questionnaire was analysed in detail by going through hypothetical cases and getting familiar with this particular CAPI application. Four representatives of the Banco de España participated in these sessions to explain the importance and difficulty of the project and to clarify any matters arising during the explanation of the questionnaire. Arguments to reduce non-cooperation were also discussed as well as appropriate ways of approaching households. Prior to the training, all interviewers were sent material to familiarise themselves with the study and were asked to answer a home test to ensure their familiarity with the study. At the end of the training, all interviewers had to conduct a mock interview with a predefined script and carry out an exercise in gaining cooperation from households. Tests of interviewers and their skills during training were marked.[12] As a result, extra practice was required from a number of interviewers in one or various aspects of the study. An extra session in gaining cooperation was needed for some interviewers and this took place in Barcelona in mid-November.

4.3 Interviewer incentives and production

An important issue is to devise an interviewer pay system that incentivises not only productivity but also data quality. Payment per completed case as opposed to fixed weekly/monthly pay is the system used by most fieldwork companies in Spain. However, given the difficulty of the study, it was deemed important for interviewers to earn fixed pay, despite the fact that such a scheme calls for closer monitoring of personnel by the fieldwork company. In the 2011 wave, interviewers received a fixed monthly pay plus an amount according to the number of interviews they completed.[13]

Out of 87 interviewers that attended training, 84 went into the field and 80 of them completed over 10 cases. The median number of interviews completed per interviewer was 95 (the mean was 98) with one interviewer completing just over 200 cases. The 25 most productive interviewers completed 50% of the cases in the final sample. The distribution of the number of completed interviews across interviewers was more homogeneous than in the EFF2008 where the median number of interviews was 55 while the mean was 71.

4.4 Tracing panel households

All panel addresses selected for the 2011 sample were visited. A household was considered a panel household if at least one of its 2011 members was a member of a participating 2008 household. Sometimes the panel status of the people currently living at the panel addresses was not straightforward from current household members' recollection because members involved in answering in the 2008 wave had left or died. During the visit, and in order to establish the panel nature of current members (and match them to the 2008 members), some automatic comparisons of demographic information about household members between the two waves were performed. This included first name, gender, year and place of birth, and

12. Marks were given for 5 different types of skills: (i) computer practice and case management, (ii) gaining cooperation, (iii) CAPI interviewing techniques, (iv) familiarity with the study (home test), and (v) fluency with the contact guide.

13. In 2002 interviewers were paid per completed interview. In 2005 payment was established according to a (non-linear) per-completed-interview scheme but with a minimum pay per month of work. In 2008 interviewers were paid according to the number of interviews they completed, with some non-linearities to encourage production, and there was also a small retribution for each visit that did not end up with an interview.

kinship with the 2008 reference person. A thorough inspection of the panel status of households, their members, and their matching between waves was later carried out by the Banco de España, as reported below. However, the improved protocol of questions used to match panel members in the 2011 wave substantially increased correct matching.

A fraction of panel households were not found at their 2008 address and had not registered a new address in the most recent Population Register. Efforts were made to trace and re-interview them. Overall, 93 of them were located at a new address and 66 of them completed the interview.

4.5 Never at home and Refusals

As seen in Table 5, aggregate cooperation rates [defined as completed/(completed+refused)][14] for the whole sample mask significant differences between the panel and the non-panel components.[15] Overall, the cooperation rate of the panel component is 78.1% compared to 33% for non-panel. These differences are large in all strata.

There is an improvement in the "never at home" rates of both the panel and the non-panel components (2% overall) compared to those in the EFF2008 (5.4% overall). Moreover, this is true for practically all strata. These lower rates in 2011 may be due to the initial telephone contact. In contrast, the cooperation rate is lower than in the EFF2008 (50.8% overall, compared to 61.0% in 2008). This is a reflection of notably smaller cooperation rates for non-panel households (33.0% compared to 44.8% in 2008) since the rates for panel households have increased (78.1% vs. 76.6%).

As a descriptive device, Table 6 presents logit parameter estimates of the accepted vs. refused decision to participate in the EFF2011, using some information at our disposal about non-participating households. We separate the panel and the non-panel samples given the very large differences in unconditional cooperation rates just described above. The most noteworthy feature that emerges is that for both panel and non-panel households the probability of cooperating diminishes with municipality size. Looking at other variables, the building condition and type-of-area variables recorded by the interviewer do not provide very telling results. Regarding differences across regions, there are lower cooperation rates in Catalonia and Navarre (in the case of non-panel households) and Navarre (in the case of panel households). In contrast, households in Asturias (non-panel) and Aragon (panel) show the highest probability of cooperation.

4.6 Control and validation

The data from the completed interviews were revised in detail in the Unit at the Banco de España to uncover potential inconsistencies and implausible values. Reports on the progress of the fieldwork and reports summarising how each interviewer was scoring on various measures were also regularly received.[16] Random (and targeted) calls to households with a strict predefined script of questions were made to check the work of the interviewers.

This control and validation process was undertaken from the beginning of the fieldwork to identify possible misunderstandings and bad practices by particular interviewers,

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14. Refusals include straight refusals (5,839).

15. The figures in Table 5 were provided by the Tax Office due to confidentiality restrictions.

16. The measures included, by interviewer, the number of interviews achieved, their average duration, the average number of questions posed, the number (and percentage) of DK/NA answers. These measures were provided for the previous week and for the previous three weeks.

with a view to trying to correct them through constant feed-back on their work. During the process of revising the data, the EFF team looked at all completed questionnaires. When additional information or clarification was considered important, the fieldwork company recontacted the household. The trade-off between getting additional information and bothering households was taken into account by the EFF team for each individual case. Additional information was sought for 212 households. The most common errors found in the recorded answers were: (i) euro vs. pesetas and (ii) incorrect interpretation of particular questions by some interviewers. However, the considerable increase in the number of confirmation questions and cross-checks introduced in this wave seems to have reduced the number of errors. Finally, as a new feature in the 2011 wave, all errors were assigned to one of 16 categories[17] which were subsequently rated according to seriousness of the error. After the end of the review process, the Banco de España produced information about the type of errors made by each interviewer (and their frequency). This interviewer-specific data quality analysis will be used in the 2014 wave to assess the hiring of 2011 interviewers and will also allow for some personalised training of rehired 2011 interviewers.

The EFF team at the Banco de España also examined the completed interviews for overall individual consistency. As a result of this process it was decided to discard: (i) completed interviews where no income information was provided (neither labour income nor asset income nor assistance income of any kind), except in the case of panel households with a high percentage of answered euro questions, and (ii) interviews where less than 30% of the euro questions were answered, unless that percentage increased substantially when answers provided in range form were taken into account. These conditions emerged as natural cut-off points after having reviewed the informational content of the completed interviews and are in line with those adopted for previous waves. The final number of discarded interviews is shown in Table 4.

Special care was also taken to ensure the actual panel status of households was accurately determined. During the editing process all panel households were analysed to check the matching of panel members across the 2008 and 2011 waves that had been done automatically during the interview.

For the EFF2011 there was also a team of 4 reviewers from the fieldwork company helping the Banco de España team. These reviewers had attended the interviewer training sessions and spent a week at the Banco de España learning how to review the data. After reviewing questionnaires, they sent their comments to the Banco de España, who had the final say. Each reviewer had a number of interviewers assigned to her (or him) and was in charge of providing them with feed-back on their work, following precise instructions from the Banco de España. Moreover, reviewers were also in charge of recontacting households when instructed by the Banco de España.

A notable improvement in the EFF2011 is the way the Banco de España and the fieldwork company have been communicating regarding the review of cases. The fieldwork company developed a web-based case access system where the Banco de España, NORC, and the different teams in TNS could interact on a specific case. All users had logins that allowed them to see each question and response for each case, and enabled them to edit and/or insert the information relevant to each player (e.g. the Banco de

17. The types of errors include, for example, "wrong choice of respondent", "wrong matching of panel household members", "mixing up euros and pesetas", "wrong use of *Other (specify)* option", etc. We include as well positive categories like "good quality interview" or "informative comments".

España did not see the identifiers). The information was anonymised by NORC and TNS before being accessed by the Banco de España. For example, personal names, phone numbers or names of employers that may appear in comment fields were erased so the respondent could not be identified.

For each case, the TNS revision team added suggestions/comments in the web interface system before submitting the case to the Banco de España for questions, opinion and recommendations on action to be taken. The review system included different tabs for viewing the following for each case: questionnaire responses, households' answers to random call questions ("call-backs"), discussion threads between the Banco de España and TNS about the case, and an evaluation of the status of the case, such as 'complete', 'needing additional information' or 'rejected'. This process of TNS review-Banco de España comment-TNS action-Banco de España review was repeated if necessary a maximum of three times. The process could equally be initiated by a Banco de España review.

The review platform was built using a relational data base system (SQL) in which the case information could be viewed in different ways (e.g. by interviewer, by region, by case number, etc.). This system proved to be an efficient way for teams to interact on all open cases because it allowed them to discuss specific questions or cases by remote means, and permitted them to track responses from the households contacted by telephone for follow-up questions.

5 The final sample

5.1 Panel and refreshment in the final sample

The total number of valid completed interviews is 6,106.[18] There are 3,711 households in the EFF2011 sample (60.8%) that also participated in the EFF2008, i.e. 59.9% of the EFF2008 sample.[19] Of the 3,711 panel households, 1,666 have participated since 2002, 1,182 since 2005 and 863 since 2008. Table 7 shows the changes in composition of the panel households between the two waves. In particular, 73.9% of them (i.e. 2,744) have neither gained nor lost members, 7.9% (292) have one additional member, and 14.1% (525) have lost one member. The number of individual household members interviewed in the two waves is 9,091.[20]

In the EFF2011, as explained in Section 3, the non-panel component of the sample (38.9% of the final sample) was entirely a refreshment sample.

5.2 Degree of oversampling in the final sample

Around 38% of the sample[21] are wealth tax filers, while in the population the proportion of households that filed a wealth tax return is around 4.7%.

Regarding actual net worth in the EFF data, Table 8 presents oversampling rates in various parts of the distribution for the 2011 and 2008 waves.[22] The oversampling rate is defined as the ratio of the number of observations actually in the sample for a specific percentile range of the distribution to the number of observations one would expect if the sample was randomly drawn from the population. As can be seen, a progressive oversampling of the wealthy is achieved. In particular, in the EFF2011, for the wealthier 1% the number of observations is over eleven times what would be expected with random sampling.

18. 116 households completed the interview through a proxy person. 85% of proxies were a daughter or son not living with the household. In only 8 cases was the proxy not a relative (e.g. administrator, accountant or friend).
19. 6,197 households participated in the EFF2008, 5,962 in the EFF2005, and 5,143 in the EFF2002.
20. 161 members (corresponding to 120 panel households) interviewed in 2011 declared they had been erroneously excluded in the 2008 interview.
21. These figures were kindly provided by the Tax Office due to confidentiality restrictions.
22. EFF2011 net worth data correspond to the preliminary imputations dated autumn 2013.

6 Correcting for unit non-response and weights

In the EFF2008 both cross-sectional and longitudinal weights are provided. In line with the confidentiality restrictions mentioned above, design and non-response weights were calculated by the Tax Office following detailed instructions from the INE. In this section we describe the construction of the weights. For details on further potential corrections for non-response and the relationship with econometric selectivity corrections, see Bover (2004).

6.1 Longitudinal weights

The initial weights for the panel households were their 2008 design weights corrected for 2008 non-response. These were further corrected for the non-response in 2011 of the 2008 sample, using as reference the 2008 population. Non-response corrections in both EFF waves are made in the cells defined by the various sampling frame variables. In particular these include municipality size, wealth stratum, and income quartile for non-filers of wealth tax returns.

In a second step, the aforementioned weights were adjusted to conform to the 2011 population, by wealth stratum and income quartile. Finally, these were further adjusted (by a linear distance function using the Calmar procedure) to conform to the 2011 structure of the population according to gender, age by municipality size, and household size by municipality size.[23,24,25]

6.2 Cross-sectional weights

To obtain cross-sectional weights, the panel and non-panel components of the sample are considered as two independent samples.

The basic weights for non-panel households are the inverse of the probability of being included in the sample (as given by the sampling design), subsequently adjusted for non-response within the cells defined by the various sampling frame variables. For panel households, the basic weights are the longitudinal weights prior to their Calmar adjustment, as described earlier.

Finally, the two sample components are combined and their weights corrected according to the relative size of the sub-samples, this being the minimum variance estimator for two independent samples representing the same population. The resulting weights were adjusted using the Calmar procedure to conform to the most recent structure of the population according to gender, age by municipality size, and household size by municipality size.

6.3 Weights using newly released 2011 Census information

At the end of autumn 2013 the INE began providing weights using the 2011 Census information for its household surveys as well as for the EFF2011. However, comparable weights for previous waves were still under construction. Therefore, the main results from the EFF2011 published in the Economic Bulletin of the Banco de España in January 2014 use the

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23. Details of the Calmar procedure, developed by the French INSEE, can be found in Sautory (1993). One useful feature of this procedure is that it allows for different levels of adjustment simultaneously, in particular, households and individuals.

24. The population data used for this calibration are the population projections done by the INE based on the most recent census and other population information.

25. Another set of longitudinal weights adjusted to conform to the 2008 population is also provided.

weights prior to the 2011 Census information since comparability with previous waves is of paramount importance to the EFF results.

For information purposes, the tables of the main 2011 results were also obtained using the new 2011 weights. In line with comments by the INE, these weights show a larger share of one-person households compared to those expected prior to the 2011 Census, but the EFF2011 results regarding distributions are practically unchanged. Some level results are different but without any term of reference from previous waves these are difficult to put into perspective.

7 Item non-response and imputation

7.1 Item non-response

Item non-response occurs when a household agrees to participate in the survey but fails to respond to one or more questions. Together with high unit non-response, item non-response is an inherent characteristic of wealth surveys. Moreover they are closely related. Indeed item non-response will partly depend on the stringency of the conditions (in terms of the number of key questions that have to be completed) that have to be met for an interview to be declared valid, which in turn affects unit non-response rates. This is an issue that often arises in the early stages since it may affect the terms of the contract with the field agency. In particular, there is a trade-off because stringent conditions would give the right incentive to interviewers but would produce self-selection into the sample in addition to that created by overall refusals to participate. Moreover, interviewers faced with overly stringent conditions are more likely to cheat or to induce answers from the household. The fieldwork contract conditions in the EFF2011 were the same as in previous waves.

The percentage of questions answered (reported in Table 1) increases somewhat as compared to 2008 (which in turn had significantly increased with respect to 2005). In particular, the percentage of euro questions answered (excluding ranges) increases from 95.4% to 96.3% at the median, and the dispersion also keeps diminishing (from 13.8 to 12.2). These comments also apply to percentages including ranges. The figures in Table 1 are similar for the panel and non-panel components of the sample.

Answers to the questions on whether the household holds a particular asset are usually readily provided. In contrast, households may have more difficulty providing information about the value of the asset held or about the amount of a particular income source. In the EFF2005 we introduced the possibility that for most questions in euro the household could give answers in the form of a range when not able or not willing to provide point values. Namely, when the household answered DK (don't know) to the point value question, he/she was prompted to provide an answer as a self-reported range (as defined by an upper and a lower bound) or, if failing to do so, to chose from a set of predefined ranges. Starting with the EFF2008 this range facility is available for answers to all euro questions.

As observed in the EFF2005 and EFF2008, information provided in the form of ranges (and more particularly as predefined ranges) appeared to reduce significantly the proportion of DK/NA answers, mainly the DK ones, without reducing the number of point value responses. This was shown by comparing the non-response rates to some key questions in similar tables for the EFF2002, the EFF2005, and the EFF2008 [see Bover (2004, 2008, 2011)].

In Table 1 we document the number of questions answered by the household, distinguishing for the euro questions between answers in point values, self-reported ranges, and predefined ranges from a list. Around one-fifth of the sample (20.5%; 1,264 households) gave at least one of their euro answers choosing a predefined range from the list and 24.8% (1,517 households) provided self-reported ranges. In any case, range answers were not used extensively, as we can see from the statistics provided. For example, the number of questions answered by a single household in the form of a predefined range was 2 at the median, 2.6 at

the mean, and 22 at the maximum. As a percentage of the euro answers provided by a household, these figures would be 6.7%, 10.5% and 85.7%, respectively.[26]

In the EFF2011 (see Table 9) we observe a decrease in the proportion of DK/NA answers for some typically high non-response questions. In particular, the percentage of DK/NA is: 15.3% for the value of the (first) self-employment business (19.6% in 2008), 2.4% for self-employment income (4.2% in 2008), 7.8% for income on dividends (11.9% in 2008), and 9.1% for bank account interest income (14.8% in 2008). This decrease in DK/NA is mostly reflected in increases in point value answers for those questions and to a lesser extent in own or fixed interval answers.

7.2 Imputation methods

In the EFF2011, imputation of DK/NA answers was performed using the same methods as in the previous three waves (for a general rationale and description, see Bover (2004); for a detailed explanation of the procedures and the models involved, see Barceló (2006); and for a comparison of the performance of different imputation methods, see Barceló (2008)).[27]

However, although the same framework and methods were used, the models for all the variables were revised and often modified as a result of the new data. Moreover, given the possibility of range answers, imputation was performed subject to the imputed values belonging to the range provided by the household, when applicable.

The panel aspect in this fourth wave of the EFF would in principle allow a new imputation of the 2008 (and 2005 and 2002) EFF data using the information obtained in 2011, and vice versa. This has not yet been done and the imputations provided so far are static ones. However, forward and backward imputation is an avenue we are exploring. To get an idea of the amount of information that could be gained from a dynamic imputation in Table 10 we calculate, for some key questions, the conditional probabilities of not giving a point value answer to a euro question in the EFF2011 having provided one in the EFF2008 (and vice versa). These indicate that for 2/3 of those questions more (relative) information might be gained from backward imputation than from forward imputation.

26. Percentages not shown in the table.

27. In the four waves, nearest neighbours procedures described in Bover (2004) were implemented only for the first iteration of the imputation process. When preparing the final data this was judged superior to using them in the final imputation as well.

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Table 1. Number of questions asked and answered per sample household, unweighted

	Average	Median	Standard deviation	Minimum	Maximum
No. of questions asked[1]	245	242	60.1	126	513
No. of € questions asked - excl. ranges - incl. ranges	 26.7 30.6	 25 28	 10.4 13.6	 6 6	 93 129
No. of questions answered[1]	241.3	239	59.2	123	513
No. of € questions answered - point value - self-reported range[2] - predefined range[3]	 24.5 2.1 2.6	 23 1 2	 10.1 1.9 2.7	 2 1 1	 93 21 22
% of questions answered[1]	98.2	98.8	2.1	80.2	100
% of € questions answered - excl. ranges - incl. ranges	 91.5 95.4	 96.3 100	 12.2 8.8	 9.5 30	 100 100

1. Excluding ranges
2. For those 1517 households who provide some answers in self-reported range format
3. For those 1264 households who provide some answers choosing a range from the list provided.

Table 2. Definition of wealth strata

Stratum 1	Do not file wealth tax returns
Stratum 2	≤ 200,000 €
Stratum 3	200,000 – 500,000 €
Stratum 4	500,000 – 900,000 €
Stratum 5	900,000 – 2,000,000 €
Stratum 6	2,000,000 – 6,000,000 €
Stratum 7	6,000,000 – 25,000,000 €
Stratum 8	> 25,000,000 €

Table 3. Number of completed interviews by month of fieldwork period

Month	No. of interviews	Percent
October	1,005	16.46
November	1,799	29.46
December	1,122	18.38
January	1,059	17.34
February	680	11.14
March	396	6.49
April	45	0.74
Total	6,106	100

Table 4. Number of attempted contacts, by type of response

	TOTAL	PANEL	NON-PANEL
Completed	6,106	3,711	2,395
Refused	5,839	999	4,840
Never at home	268	91	177
Out of scope (wrong address, not a housing unit, empty dwelling, deceased[1], others out of scope)	1,165	472	693
Discarded after supervision	64	19	45
Total	13,442	5,292	8,150

1. Only in cases of 2008 one person panel household.

Table 5. Some measures of non-participation (%), by wealth stratum

	TOTAL		PANEL		NON-PANEL	
	Never at home[1]	Cooperation rate[2]	Never at home	Cooperation rate	Never at home	Cooperation rate
Total	2.0	50.8	1.7	78.1	2.2	33.0
Stratum 1	1.5	62.0	1.6	80.2	1.5	41.4
Stratum 2	0.6	56.7	0.9	71.0	0.0	26.0
Stratum 3	2.9	50.0	3.3	77.9	2.5	28.6
Stratum 4	2.3	37.8	2.9	76.2	2.2	28.1
Stratum 5	2.7	42.1	1.3	74.3	3.1	30.7
Stratum 6	2.4	36.8	2.4	68.1	2.4	25.7
Stratum 7	3.8	26.5	2.2	68.6	4.0	20.9
Stratum 8	2.3	24.6	0.0	61.8	2.5	21.0
Navarre and Basque Country	0.9	50.4	1.2	74.7	0.8	37.9

1. Defined as (Never at home/Total attempted contacts)
2. Defined as (Completed/Completed+Refused)

Table 6. Logit parameter estimates of the completed vs. refused decision[1, 2]:

Panel vs. non-panel sample

	Odds ratio	t-ratio	Odds ratio	t-ratio
	Non-panel sample		Panel sample	
Building condition				
Good	0.836	1.78	0.964	0.22
In need of some maintenance	0.959	0.29	0.988	0.06
Very poor	1.300	0.64	0.848	0.32
Type of area				
High standing	0.994	0.04	1.000	0.00
Medium	1.151	0.84	1.025	0.09
Medium-low	1.505	2.23	1.060	0.20
Low	1.411	1.21	1.523	1.01
Size of municipality				
2,000<inhab=<10,000	0.783	1.36	1.113	0.48
10,000<inhab=<50,000	0.605	2.95	1.055	0.26
50,000<inhab=<100,000	0.450	4.48	0.883	0.56
100,000<inhab=<500,000	0.392	5.64	0.830	0.91
500,000<inhab=<1,000,000	0.282	6.78	0.570	2.38
inhab>1,000,000	0.390	5.22	0.625	2.02
Region				
Aragon	1.000	0.00	1.513	1.66
Asturias	2.006	3.37	0.933	0.30
Balearic Islands	1.017	0.09	0.674	1.49
Canary Islands	0.775	1.60	0.626	2.42
Cantabria	1.492	1.68	1.506	1.15
Castille-La Mancha	1.429	1.83	1.348	1.21
Castille-Leon	1.379	2.26	1.242	1.07
Catalonia	0.708	3.24	0.708	2.30
Valencia	1.088	0.75	0.941	0.41
Extremadura	1.761	2.10	0.599	1.96
Galicia	1.057	0.39	0.912	0.44
Madrid	0.853	1.29	0.987	0.08
Murcia	1.634	2.51	1.012	0.05
Navarre	0.725	1.33	0.256	4.42
Basque Country	1.220	1.60	0.817	1.05
La Rioja	0.969	0.11	0.392	2.71
Number of observations	7,235 of which 2,395 yes (33.1%)		4,710 of which 3,711 yes (78.8%)	
Pseudo-R^2	0.03		0.02	

1. The omitted categories are: luxury building, very high standing neighbourhood, municipalities with 2,000 inhabitants or less, Andalusia.

Table 7. Change in the composition of panel households

	No. of members that dropped out between the 2008 and the 2011 wave				Total
	0	1	2	3 or more	
No. of new members in 2011 compared to 2008					
0	2,744	469	86	27	3,326
1	241	37	10	4	292
2	44	9	4	0	57
3 or more	24	10	1	1	36
Total	3,053	525	101	32	3,711

Table 8. Degree of oversampling in the final sample

Net worth decile group	EFF 2008		EFF 2011	
	Number of observations	Oversampling rate[1]	Number of observations	Oversampling rate
Bottom 50%	2095	0.68	1904	0.62
50% to 90%	2304	0.93	2161	0.88
90% to 95%	499	1.61	587	1.92
95% to 99%	712	2.87	760	3.11
Top 1%	587	9.47	693	11.35

Table 9. Reporting rates (%) of various items, unweighted sample

	Have item		Value for those having the item					
	Yes	Unknown	Point value	Own interval	Fixed interval	DK	NA	NP/NF[1]
Own main residence	87.6	0.0	87.5	5.0	3.7	3.2	0.3	0.2
Amount owed, 1st loan, main residence	17.9	0.0	94.7	1.7	1.0	2.2	0.0	0.4
Monthly payment, 1st loan, main residence	17.9	0.0	98.0	1.2	0.5	0.0	0.0	0.3
Rent main residence	7.7	0.0	97.2	1.1	0.2	0.2	0.4	0.9
Other real estate, 1st property	56.6	0.1	87.4	3.3	3.5	4.7	0.4	0.7
Amount owed, 1st loan, 1st other real estate	6.7	0.0	92.0	2.4	1.7	3.6	0.0	0.2
Accounts usable for payments	99.7	0.0	88.5	2.2	3.1	2.4	3.7	0.2
Accounts not usable for payments	30.5	0.1	88.5	2.3	3.1	2.1	3.7	0.4
Listed shares	27.4	0.1	86.4	2.2	3.9	5.6	1.9	0.0
Unlisted shares	6.6	0.2	73.1	4.7	5.7	11.9	3.2	1.2
Mutual funds, 1st fund	12.7	0.3	88.2	0.5	3.0	5.5	2.6	0.1
Fixed income securities	5.3	0.3	87.4	0.3	1.5	5.5	4.0	1.2
Pension plans, 1st plan	31.1	0.1	84.6	2.8	2.2	7.9	1.7	0.8
Life insurance (1st policy) coverage	13.0	0.0	76.9	3.8	3.8	13.8	1.0	0.8
Business market value (household), 1st business	19.8	0.1	71.3	6.9	3.6	12.8	2.5	2.8
Wage income (reference person, t-1)	33.3	0.0	96.7	0.8	1.1	0.1	0.9	0.4
Self-employment income (ref. person, t-1)	14.3	0.0	92.8	1.4	2.6	0.9	1.5	0.8
Unemployment benefits (ref. person, t-1)	5.3	0.0	97.2	0.9	0.3	0.3	0.0	1.2
Pensions (reference person, t-1)	35.1	0.0	97.9	0.4	0.5	0.1	0.4	0.6
Income from real assets (t-1)	18.4	0.1	94.8	0.5	1.2	1.6	1.2	0.6
Income from dividends, coupons, etc (t-1)	8.4	1.1	86.1	1.6	3.7	6.6	1.2	0.8
Bank accounts interest income (t-1)	40.7	3.0	83.2	2.8	4.7	7.0	2.1	0.3
Food expenditure	100.0	0.0	96.8	1.2	0.7	1.0	0.2	0.0
Non-durable expenditure	100.0	0.0	97.2	1.0	0.8	0.6	0.2	0.1

1. NP/NF: not plausible/not formulated.

Table 10. Conditional probabilities of not giving a point value answer to a € question in the EFF 2011 having provided one in the EFF 2008 (and vice versa), unweighted panel component of the sample (%).

	Pr (Point value 2011 = 0[1] | Point value 2008 = 1)				Pr (Point value 2008 = 0 | Point value 2011 = 1)
	Intervals	NP/NF	DK/NA[2]	Total	
Own main residence	7.1	0.3	2.9	10.3	7.1
Amount owed, 1st loan, main residence	2.0	0.2	1.1	3.3	6.6
Monthly payment, 1st loan, main residence	1.3	0.1	0.0	1.4	1.3
Rent main residence	0.5	0.0	0.0	0.5	0.5
Other real estate, 1st property	5.1	0.5	3.0	8.7	7.0
Amount owed, 1st loan, 1st other real estate	1.4	0.0	1.4	2.7	1.4
Accounts usable for payments	4.3	0.1	3.5	8.0	10.3
Accounts not usable for payments	2.2	0.1	1.0	3.3	5.3
Listed shares	3.4	0.0	3.6	7.0	8.0
Unlisted shares	2.9	0.0	4.3	7.2	5.6
Mutual funds, 1st fund	0.7	0.0	2.7	3.4	3.8
Fixed income securities	0.0	0.0	1.9	1.9	2.7
Pension plans, 1st plan	3.2	0.7	4.4	8.3	10.3
Life insurance (1st policy) coverage	3.2	0.6	4.0	7.8	4.3
Business market value (household), 1st business	6.6	1.8	7.7	16.2	28.0
Wage income (reference person, t-1)	0.9	0.2	0.5	1.7	3.6
Self-employment income (ref. person, t-1)	3.3	0.2	0.7	4.2	5.5
Unemployment benefits (ref. person, t-1)	0.0	0.0	0.0	0.0	0.5
Pensions (reference person, t-1)	0.9	0.6	0.3	1.7	2.7
Income from real assets (t-1)	0.8	0.0	0.8	1.6	3.9
Income from dividends, coupons, etc (t-1)	1.7	0.6	1.7	3.9	2.0
Bank accounts interest income (t-1)	3.1	0.1	2.8	6.0	11.9
Food expenditure	1.5	0.1	0.7	2.3	1.8
Non-durable expenditure	1.5	0.2	0.7	2.3	2.3

1. "Point value 2011 = 0" is the sum of "Interval in 2011", "NP/NF in 2011", and "DK/NA in 2011". The four columns below show the overall conditional probability and its three components.

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